

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Steven G. Johnson et al.                      Art Unit : Unknown  
Serial No. :    Examiner : Unknown  
Filed : July 16, 2003  
Title : LOW-LOSS PHOTONIC CRYSTAL WAVEGUIDE HAVING LARGE CORE  
RADIUS

**BOX PATENT APPLICATION**

Commissioner for Patents  
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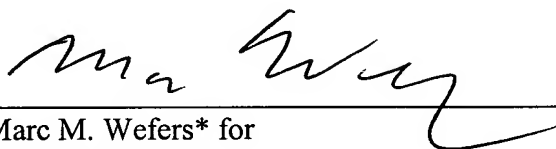
INFORMATION DISCLOSURE STATEMENT

Under 35 USC §120, this application relies on the earlier filing date of application serial number 10/057,258, filed on January 25, 2002, which in turn claims priority to U.S. provisional patent applications 60/264,201 filed January 25, 2001 and 60/337,603 filed November 8, 2001. Copies of the listed references were submitted to and/or cited by the Office in the prior application and, therefore, are not provided in this application:

This statement is being filed with the application. Please apply any charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: 7/16/03

  
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**\*See attached document certifying that Marc M. Wefers has limited recognition to practice before the U.S. Patent and Trademark Office under 37 C.F.R. § 10.9(b).**

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Substitute Form PTO-1449 (Modified)  <b>Information Disclosure Statement by Applicant</b> (Use several sheets if necessary)  (37 CFR §1.98(b))	U.S. Department of Commerce Patent and Trademark Office	Attorney's Docket No. <b>13445-002002</b>	Application No.
	Applicant <b>Steven G. Johnson et al.</b>		
	Filing Date <b>July 16, 2003</b>	Group Art Unit	

U.S. Patent Documents							
Examiner Initial	Desig. ID	Patent Number	Issue Date	Patentee	Class	Subclass	Filing Date If Appropriate
	AA	4,852,968	08/1989	Reed			
	AB	5,185,827	02/1993	Poole			
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	AD	5,448,674	09/1995	Vengsarkar et al.			
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	AW	2002/0039046	04/2002	Lipson, et al.			
	AX						
	AY						

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(37 CFR §1.98(b))			

Foreign Patent Documents or Published Foreign Patent Applications								
Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation	
							Yes	No
	BA	2,288,469	10/1995	Great Britain				
	BB	0 060 085	09/1982	Europe				
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	BD	0 426 203	05/1991	Europe				
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	BF	2001-051244	02/2001	Japan				
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	BH	WO 94/16345	07/1994	WIPO				
	BI	WO 97/01774	01/1997	WIPO				
	BJ	WO 99/47465	09/1999	WIPO				
	BK	WO 99/49340	09/1999	WIPO				
	BL	WO 99/49341	09/1999	WIPO				
	BM	WO 00/22466	04/2000	WIPO				
	BN	WO 00/51268	08/2000	WIPO				
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	BP	WO 00/77549	12/2000	WIPO				
	BQ	WO 01/69295	09/2001	WIPO				
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	BS	A. G. Bulushev et al. "Spectrally selective mode conversion at in homogeneities of optical fibers," Sov. Tech. Phys. Lett., 14, 506-507 (1988).
	BT	A. N. Lazarchik, "Bragg fiber lightguides," Radiotekhnika i elektronika, 1, 36-43 (1988).
	BU	C. M. de Sterke et al., "Differential losses in Bragg fibers," J. Appl. Phys., 76, 680-688 (1994).
	BV	C. Moeller, "Mode converters in the Doublet III ECH microwave system," Int. J. Electronics, 53, 587-593 (1982).
	BW	D. Marcuse et al., "Mode conversion caused by diameter changes of a round dielectric waveguide," Bell Syst. Tech. J., 48, 3217-3232 (1969).

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	CA	D. Marcuse, "Theory of dielectric optical waveguides," (Academic, New York, 1974).
	CB	E. Luneville et al., "An original approach to mode converter optimum design," IEEE Trans. Microwave Theory Tech., 46, (1998).
	CC	E. Mao et al., "Wavelength-selective semiconductor in-line fibre photodetectors," Electronics Letters, Vol. 36, No. 6, pp. 515-516, March 16, 2000.
	CD	E. Marcatili et al., "Hollow metallic and dielectric waveguides for long distance optical transmission and lasers," Bell Syst. Tech. J., 43, 1783-1809 (1964).
	CE	E. Peral et al., "Supermodes of grating-coupled multimode waveguides and application to mode conversion between copropagating modes mediated by backward Bragg scattering," J. Lightwave Tech., 17, 942-947 (1999).
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	CG	F. Brechet et al., "Singlemode propagation into depressed-core-index photonic-bandgap fibre designed for zero-dispersion propagation at short wavelengths," Elec. Lett., 36, 514-515 (2000).
	CH	G. H. Childs, "50mm diameter TE <sub>01</sub> mode helical waveguide optimization," Electronics Lett., 14, 140-141 (1978).
	CI	H. F. Taylor, "Bending effects in optical fibers," J. Lightwave Tech., 2, 617-628 (1984).
	CJ	H. Kumric et al., "Optimized overmoded TE <sub>01</sub> -to-TM <sub>11</sub> mode converters for high-power millimeter wave applications at 70 and 140 GHz," Int. J. Infrared Millim. Waves, 7, 1439-1463 (1986).
	CK	H. Kumric et al., "Optimization of mode converters for generating the fundamental TE <sub>01</sub> mode from TE <sub>06</sub> gyrotron output at 140 GHz," Int. J. Electron., 64, 77-94 (1988).
	CL	H. Yajima, "Dielectric bypass waveguide mode order converter," IEEE J. Quantum Electronics, 15, 482-487 (1979).
	CM	I. Gannot, et al., "Current Status of Flexible Waveguides for IR Laser Radiation Transmission", IEEE J. Sel. Topics in Quantum Electr., IEEE Service Center, Vol. 2, No. 4, pp.880-888 (Dec 1996); XP000694378
	CN	I. K. Hwang et al., "Long-period fiber gratings based on periodic microbends," Opt. Lett., 24, 1263-1264 (1999).
	CO	I. Ogawa et al., "Design of a quasi-optical mode conversion system with variable output beam size," Int. J. Electron., 87, 457-467 (2000).
	CP	J. A. Harrington, "A review of IR transmitting, hollow waveguides", Fiber Integr. Opt. 19, 211-227 (2000).
	CQ	J.C. Knight et al., "Photonic band gap guidance in optical fibers" Science 282, 1476-1478 (1998).
	CR	J. J. Refi, "Optical fibers for optical networking," Bell Labs Technical Journal, 4, 246-261 (1999).
	CS	J. N. Blake et al., "Fiber-optic modal coupler using periodic microbending," Opt. Lett., 11, 177-179 (1986).
	CT	J. S. Levine, "Rippled wall mode converters for circular waveguide," Int. J. Infrared Millim. Waves, 5, 937-952 (1984).
	CU	J.L. Auguste et al., "-1800ps/(nm-km) chromatic dispersion at 1.55µm in dual concentric core fibre", Elec. Lett., 28 <sup>th</sup> September 2000, Vol. 36, No. 20.

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	DA	J.W. Hahn et al., "Measurement of nonresonant third-order susceptibilities of various gases by the nonlinear interferometric technique," J. Opt. Soc. Am. B, 12, 1021-1027 (1995).
	DB	K. J. Bunch et al., "The helically wrapped circular waveguide," IEE Trans. Electron Devices, 34, 1873-1884 (1987).
	DC	K. O. Hill et al., "Efficient mode conversion in telecommunication fiber using externally written gratings," Electron. Lett., 26, 1270-1272 (1990).
	DD	L. Dong et al., "Intermodal coupling by periodic microbending in dual-core fibers—comparison of experiment and theory," J. Lightwave Tech., 12, 24-27 (1994).
	DE	L. Gruner-Nielson et al., "Dispersion compensating fibers," Optical Fiber Tech., 6, 164-180 (2000).
	DF	L. M. Field, "Some slow-wave structures for traveling-wave tubes," Proc. IRE, 37, 34-40 (1949).
	DG	Lars Gruner-Nielson et al., "New dispersion compensating fibers for simultaneous compensation of dispersion and dispersion slope of non-zero dispersion shifted fibres in the C or L band", OFC '00.
	DH	M. Ibanescu et al., "An all-dielectric coaxial waveguide," Science, 289, 415-419 (2000).
	DI	M. J. Buckley et al., "A single period TE <sub>02</sub> -TE <sub>01</sub> mode converter in a highly overmoded circular waveguide," IEEE Trans. Microwave Theory Tech., 39, 1301-1306 (1991).
	DJ	M. J. Weber et al., "Measurements of the electronic and nuclear contributions to the nonlinear refractive index of beryllium fluoride glasses," Appl. Phys. Lett., 32, 403-405 (1978).
	DK	M. Miyagi, et al., "Transmission characteristics of dielectric-coated metallic waveguides for infrared transmission: slab waveguide model", IEEE J. Quantum Elec. QE-19, 136-145 (1983).
	DL	M. Miyagi, et al., "Wave propagation and attenuation in the general class of circular hollow waveguides with uniform curvature", IEEE Trans. Microwave Theory Tech. MTT-32, 513-521 (1984).
	DM	M. Otsuka et al., "Development of mode converters for 28 GHz electron cyclotron heating system," Int. J. Electron, 70, 989-1004 (1991).
	DN	M. Thumm, "High power millimeter-wave mode converters in overmoded circular waveguides using periodic wall perturbations," Int. J. Electron., 57, 1225-1246 (1984).
	DO	Mitsunobu Miyagi et al., "Design theory of dielectric-coated circular metallic waveguides for infrared transmission," J. Lightwave Tech., Vol. LT-2, 116-126, April 1984.
	DP	N. J. Doran et al., "Cylindrical Bragg fibers: a design and feasibility study for optical communications," J. Lightwave Tech., 1, 588-590 (1983).
	DQ	Pochi Yeh et al., "Theory of Bragg fiber," J. Opt. Soc. Am., Vol. 68, 1196-1201 September 9, 1978.
	DR	R. F. Cregan et al., "Single-mode photonic band gap guidance of light in air," Science, 285, 1537-1539 (1999).
	DS	R.A. Abram et al., "Mode conversion in an imperfect waveguide," J. Phys. A, 6, 1693-1708 (1973).
	DT	S. Ahn et al., "Analysis of helical waveguide," IEEE Trans. Electron Devices, 33, 1348-1355 (1986).
	DU	S. H. Yun et al., "All-fiber tunable filter and laser based on two-mode fiber," Opt. Lett., 21, 27-29 (1996).
	DV	S.P. Morgan, "Theory of curved circular waveguide containing an inhomogeneous dielectric," Bell Syst. Tech. J., 36, 1209-1251 (1957).

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	EA	T. Cardinal et al., "Nonlinear optical properties of chalcogenide glasses in the system As-S-Se," J. Non-Cryst. Solids, 256, 353-360 (1999).
	EB	T. Iyama et al., "Propagation characteristics of a dielectric-coated coaxial helical waveguide in a lossy medium, IEEE Trans. Microwave Theory Tech., 45, 557-559 (1997).
	EC	T. Kawanishi et al., "Coaxial periodic optical waveguide," Optics Express, 7, 10-22 (2000).
	ED	T. Liang et al., "Mode conversion of ultrafast pulses by grating structures in layered dielectric waveguides," J. Lightwave Tech., 15, 1966-1973 (1997).
	EE	T. M. Monro et al., "Holey Optical Fibers: An efficient modal model," IEEE J. Lightwave Technol., 17, 1093-1102 (1999).
	EF	T. ul Hag et al., "Optimized irregular structures for spatial- and temporal-field transformation," IEEE Trans. Microwave Theory Tech., 46, 1856-1867 (1998).
	EG	W. Lawson et al., "The design of serpentine-mode converters for high-power microwave applications," IEEE Trans. Microwave Theory Tech., 48, 809-814 (May 2000).
	EH	Y. Fink et al., "A dielectric omnidirectional reflector," Science, 282, 1679-1682 (1998).
	EI	Y. Fink et al., "Guiding optical light in air using an all-dielectric structure," J. Lightwave Tech., 17, 2039-2041 (1999).
	EJ	Y. W. Li et al., "Triple-clad single-mode fibers for dispersion shifting," IEEE J. Lightwave Technol., 11, 1812-1819 (1993).
	EK	Y. Xu et al., "Asymptotic analysis of Bragg fibers and dielectric coaxial fibers," In Proc. SPIE, A. Dutta, A. A. S. Awwal, N. K. Dutta, and K. Okamoto, eds., 4532, 191-205 (2001).
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	EM	

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